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File: USPT

Sep 24, 2002

US-PAT-NO: 6455096

DOCUMENT-IDENTIFIER: US 6455096 B1

TITLE: Hard candy with a relatively-high moisture and hardness, and process of the same

DATE-ISSUED: September 24, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
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ASSIGNEE-INFORMATION:

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APPL-NO: 09/ 296650 [PALM]

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FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
JP	10-134553	April 28, 1998
JP	10-172085	June 5, 1998

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US-CL-ISSUED: 426/660; 426/72, 426/73, 426/74

US-CL-CURRENT: 426/660; 426/72, 426/73, 426/74

FIELD-OF-SEARCH: 426/660, 426/72, 426/73, 426/74

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected

Search ALL

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/> <u>3632357</u>	January 1972	Childs	
<input type="checkbox"/> <u>4158064</u>	June 1979	Banowitz	
<input type="checkbox"/> <u>4497846</u>	February 1985	Boursier et al.	
<input type="checkbox"/> <u>4518581</u>	May 1985	Miyake et al.	424/48
<input type="checkbox"/> <u>4582709</u>	April 1986	Peters et al.	
<input type="checkbox"/> <u>4692339</u>	September 1987	Stetson et al.	
<input type="checkbox"/> <u>4738854</u>	April 1988	Friello et al.	
<input type="checkbox"/> <u>4753816</u>	June 1988	Vink et al.	
<input type="checkbox"/> <u>4820544</u>	April 1989	Barcelon et al.	
<input type="checkbox"/> <u>4883685</u>	November 1989	Kondou	
<input type="checkbox"/> <u>5073389</u>	December 1991	Wienecke	426/103
<input type="checkbox"/> <u>5314708</u>	May 1994	Gonze	
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<input type="checkbox"/> <u>5399354</u>	March 1995	Ells et al.	
<input type="checkbox"/> <u>5538883</u>	July 1996	Nishimoto et al.	435/200
<input type="checkbox"/> <u>5543513</u>	August 1996	Mandai et al.	536/123.13
<input type="checkbox"/> <u>5554410</u>	September 1996	Bell et al.	
<input type="checkbox"/> <u>5576303</u>	November 1996	Shibuya et al.	514/53
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<input type="checkbox"/> <u>5637344</u>	June 1997	Carpenter et al.	
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<input type="checkbox"/> <u>5892026</u>	April 1999	Okada et al.	
<input type="checkbox"/> <u>5912007</u>	June 1999	Pan et al.	
<input type="checkbox"/> <u>5916881</u>	June 1999	Okada et al.	

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0 739 986	October 1996	EP	
57-34788	July 1982	JP	
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Patent Abstracts of Japan, "JP 08 256694 A, published Oct. 8, 1996, applicant Nippon Shokuhin Kako Co Ltd".
Patent Abstracts of Japan, "JP 10 210939 A, published Aug. 11, 1998, applicant Fuankeru KK".

ART-UNIT: 1761

PRIMARY-EXAMINER: Bhat; Nina

ATTY-AGENT-FIRM: Browdy and Neimark

ABSTRACT:

A hard candy with a relatively-high moisture and hardness, and process of the same. The levels of moisture and hardness are respectively from about 3.5% to about 10%, and at least 4.0 kg as a penetration strength when measured by a rheometer. The hard candy is characteristic of a relatively-high transparency, insubstantial stickiness to the teeth, and lesser stimulation to the teeth.

18 Claims, 0 Drawing figures

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TITLE: Hard candy with a relatively-high moisture and hardness, and process of the same

Brief Summary Text (17):

Examples of the saccharides suitably used in the present invention are one or more saccharides such as glucose, fructose, isomerized sugars, honey, maple syrup, maltose, isomaltose, sucrose, lactose, paratinose, neotrehalose, maltotriose, panose, raffinose, glucosyl trehalose, lactosucrose, isomaltooligosaccharides, soybean oligosaccharides, fructooligosaccharides, oligosaccharides with lactose and fructose, starch hydrolysates, and cyclodextrins; and sugar alcohols such as erythritol, xylitol, sorbitol, maltitol, lactitol, palatinate, and hydrogenated starch hydrolysates. The proportion of the saccharides to the total sugars can be chosen from those less than 40%, and preferably not higher than 35%, d.s.b., depending on use.

Brief Summary Text (24):

The preferences used in the present invention include a tea, green tea, coffee, cocoa, coca, herb, and medicinal plant; Examples of the herbs used in the present invention are a garlic, ginger, Japanese horseradish, mustard, parsley, Chinese parsley, green and red perilla (a beefsteak plant), Chinese chive, Welsh onion, celery, water dropwort, cresson, red pepper, Japanese pepper, pepper, rosemary, mint, mugwort, plantain, bad-smelling perennial plant of the family Saururaceae, Cassia obtusifolia, Japanese green gentian, aloe, licorice, turmeric, Japanese indigo plant, Pfaffia, loquat leaf, field horsetail, bamboo leaf, Japanese apricot, green tea, fresh leaf of burley, buckwheat leaf, ginkgo leaf, tochu-cha (a Chinese gutta percha leave), oobanasaruberi (a plant of the family Lythrum), Aspalathus linearis, and Gymnema sylvestre. The biological active substances and medicinal ingredients used in the present invention include vitamins, hormones, saponins, antibiotics, antipyretic/sedative agents, fungicides, snapping turtle extracts, oyster meat extracts, ginseng extracts, nandin extracts, Chinese quince extracts, chlorella extracts, aloe extracts, propolis extracts, glycosyl hesperidin, and glycosyl rutin. Examples of the additives suitably used in the present invention are sweeteners, viscosity-imparting agents, stabilizers, antioxidants, acids, seasonings, emulsifiers, enhancers, colors, and flavors.

CLAIMS:

4. The hard candy according to claim 1, wherein said another saccharide is one or more members selected from the group consisting of glucose, fructose, isomerized sugars, honey, maple syrup, maltose, isomaltose, sucrose, lactose, paratinose, neotrehalose, maltotriose, panose, raffinose, glucosyl trehalose, lactosucrose, isomaltooligosaccharides, soybean oligosaccharides, fructooligosaccharides, oligosaccharides with lactose and fructose, starch hydrolysates, and cyclodextrins; and sugar alcohols including erythritol, xylitol, sorbitol, maltitol, lactitol, palatinate, and hydrogenated starch hydrolysates.

11. The process according to claim 10, wherein said other saccharide is one or more members selected from the group consisting of glucose, fructose, isomerized sugars, honey, maple syrup, maltose, isomaltose, sucrose, lactose, paratinose, neotrehalose, maltotriose, panose, raffinose, glucosyl trehalose, lactosucrose, isomaltooligosaccharides, soybean oligosaccharides, fructooligosaccharides, oligosaccharides with lactose and fructose, starch hydrolysates, and cyclodextrins;

and sugar alcohols including erythritol, xylitol, sorbitol, maltitol, lactitol, palatinate, and hydrogenated starch hydrolysates.

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US-CL-CURRENT: 426/660; 426/72, 426/73, 426/74

CLAIMS:

We claim:

1. A hard candy comprising trehalose and optionally another saccharide, and which has a moisture content in the range of about 3.5 w/w % to about 10 w/w %, wherein the content of said trehalose to the total sugars is over 60 w/w %, on a dry solid basis, said hard candy prepared by boiling an aqueous trehalose solution having a trehalose concentration of less than 70%, at a temperature of at least 125.degree. C. but not higher than 155.degree. C. to produce said hard candy having a moisture content in the range of about 3.5 w/w % to about 10 w/w %.
2. The hard candy according to claim 1, which has a hardness of at least 4.0 kg as a penetration strength when measured by a rheometer.
3. The hard candy according to claim 1, wherein said trehalose is .alpha.,.alpha.-trehalose.
4. The hard candy according to claim 1, wherein said another saccharide is one or more members selected from the group consisting of glucose, fructose, isomerized sugars, honey, maple syrup, maltose, isomaltose, sucrose, lactose, paratinose, neotrehalose, maltotriose, panose, raffinose, glucosyl trehalose, lactosucrose, isomaltooligosaccharides, soybean oligosaccharides, fructooligosaccharides, oligosaccharides with lactose and fructose, starch hydrolysates, and cyclodextrins; and sugar alcohols including erythritol, xylitol, sorbitol, maltitol, lactitol, palatinatate, and hydrogenated starch hydrolysates.
5. The hard candy according to claim 1, wherein the content of said saccharide is less than 40 w/w % of the total sugars, on a dry solid basis.
6. The hard candy according to claim 1, which contains one or more edible food materials selected from the group consisting of nutritives, teas, green teas, coffees, cocoas, cocas, herbs, medicinal plants, biological active substances, medicinal ingredients, and additives.
7. The hard candy according to claim 1, which is transparent and/or stabilized.

8. The hard candy according to claim 1, which does not substantially stick to and/or stimulate the teeth.

9. A process for producing a hard candy with a moisture content in the range of about 3.5 w/w % to about 10 w/w %, which comprises boiling an aqueous trehalose solution to give a moisture content of from about 3.5 w/w % to about 10 w/w %.

10. The process according to claim 9, wherein said aqueous trehalose solution is a member selected from the group consisting of aqueous solutions containing only trehalose as a saccharide, and aqueous saccharide solutions comprising trehalose and other saccharide other than trehalose, said trehalose being used in an amount of over 60 w/w % to the total sugars, on a dry solid basis, when used together with said other saccharide.

11. The process according to claim 10, wherein said other saccharide is one or more members selected from the group consisting of glucose, fructose, isomerized sugars, honey, maple syrup, maltose, isomaltose, sucrose, lactose, paratinose, neotrehalose, maltotriose, panose, raffinose, glucosyl trehalose, lactosucrose, isomaltooligosaccharides, soybean oligosaccharides, fructooligosaccharides, oligosaccharides with lactose and fructose, starch hydrolysates, and cyclodextrins; and sugar alcohols including erythritol, xylitol, sorbitol, maltitol, lactitol, palatinose, and hydrogenated starch hydrolysates.

12. The process according to claim 9, wherein said aqueous trehalose solution has a trehalose concentration of less than 70 w/w %.

13. The process according to claim 9, wherein said aqueous trehalose solution is one prepared by boiling an aqueous trehalose solution containing less than 70 w/w % trehalose.

14. The process according to claim 9, wherein said hard candy has a hardness of at least 4.0 kg as a penetration strength when measured by a rheometer.

15. The process according to claim 9, wherein said trehalose is .alpha., .alpha.-trehalose.

16. The process according to claim 9, which comprises a step of incorporating into said aqueous trehalose solution one or more edible materials selected from the group consisting of nutritives, teas, green teas, coffees, cocoas, cocas, herbs, medicinal plants, biological active substances, medicinal ingredients, and additives.

17. In a method for making hard candy comprising providing an aqueous solution of at least one sugar and condensing said solution to reduce the water content, the improvement comprising: boiling an aqueous trehalose solution having a trehalose concentration of less than 70%, at a temperature of at least 125.degree. C. but not higher than 155.degree. C. to condense into a hard candy having a moisture content in the range of about 3.5 w/w % to about 10 w/w %, whereby the moisture content of said hard candy is increased while maintaining hardness of said hard candy, wherein said aqueous solution contains said trehalose in an amount of over 60% to the total sugars and optionally contains another saccharide in an amount of less than 40%, on a dry solid basis.

18. The method according to claim 17, wherein the level of hardness of said hard candy is at least 4.0 kg as a penetration strength when measured by a rheometer.